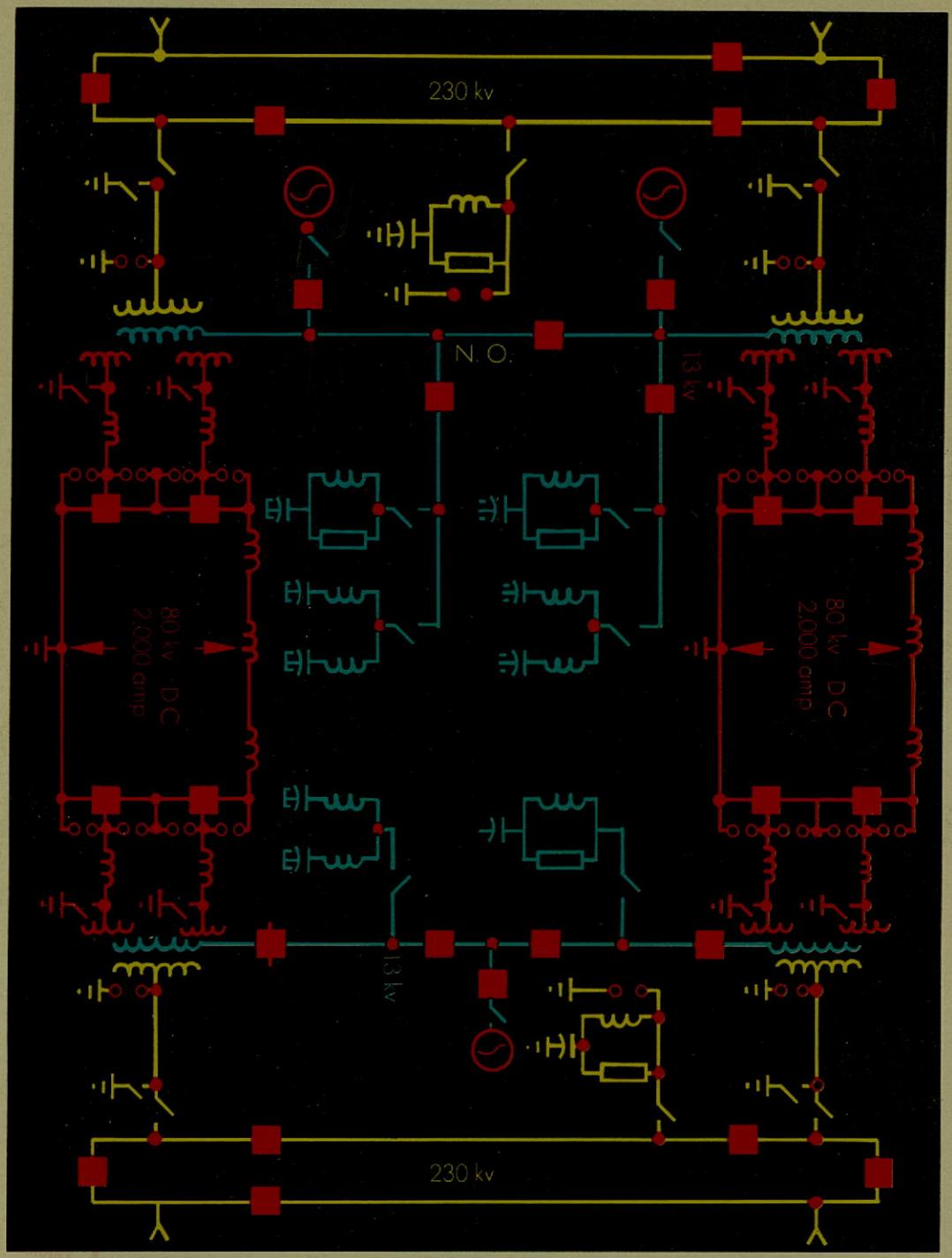
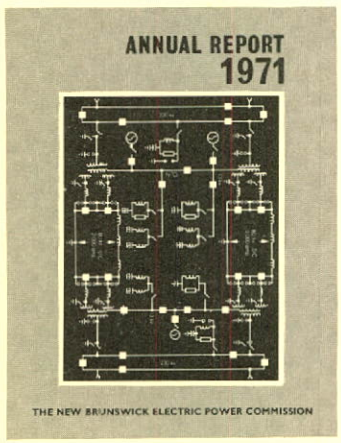
ANNUAL REPORT 1971



THE NEW BRUNSWICK ELECTRIC POWER COMMISSION

New Brunswick's shores offer a multitude of changing scenes. This photo of a placid fishing cove was taken at Deer Island off New Brunswick's south coast.



THE COVER

The Main Circuit arrangements of the Eel River High Voltage Direct Current Converter Station . . . The diagram on the cover of this year's Annual Report symbolizes several firsts: The Eel River HVDC Converter Station is the physical realization of N.B. Power's first high capacity interconnection with Hydro-Quebec. It is the first commercial HVDC facility in the world to use solid state valves; and finally, the station was featured as the cover story in the trade magazine *Electrical World* of October 1, 1970, from which this cover is taken.

Power enters the station at the top via 2-230 KV lines from the Quebec border. The 230 KV system is shown in yellow. It is then transformed to 40 KV and converted to DC. This is shown in red. At the New Brunswick side of the Converter Station it is converted back to AC and then transformed to 230 KV, at the bottom of the diagram, shown in yellow.

Reactive power is supplied to the station at the 13 KV tertiary voltage, shown in blue, by 3-110 MVAR synchronous condensers—two on the Quebec side and one on the New Brunswick side.

Harmonic filters which ensure a pure sinusoidal waveform on the AC power systems are attached to the tertiary and the 230 KV busses and shown in blue and yellow respectively.

The gold border symbolizes the 50th Anniversary of the appointment by Order-in-Council of the Commission, celebrated during the year.

1971 ANNUAL REPORT

FOR THE PERIOD OF APRIL 1st, 1970 TO MARCH 31st, 1971

June 23, 1971

To His Honour W. S. Bird
Lieutenant Governor of New Brunswick

May it please your Honour:

The New Brunswick Electric Power Commission begs leave to submit, in accordance with the Electric Power Act, Chapter 41, of Statutes of New Brunswick 1961-62 the following report for the twelve month period ended March 31, 1971.

Your obedient Servant,

G. E. McInerney, Q.C., Chairman
The New Brunswick
Electric Power Commission

THE NEW BRUNSWICK ELECTRIC POWER COMMISSION

Si vous préférez une version française, nous nous ferons un plaisir de vous la faire tenir à votre demande—Service d'Informations, Commission d'Énergie Électrique du Nouveau-Brunswick.

CHAIRMAN'S FOREWORD

In many major respects, the year under review was a notable one for The New Brunswick Electric Power Commission.

Additional power supplies to supplement existing generation were assured for the period 1971 to 1976 by agreement on the final terms and the signing of the contract with the Quebec Hydro-Electric Commission. Over 11 billion kilowatt hours of power from the Churchill Falls project, surplus to the Quebec system during the period, will be purchased. Moreover, the interconnection of our system with the Maine Electric Power Company became a reality. This was accomplished by the energizing of the first section of the extra high voltage transmission line between our Keswick terminal and the Orrington sub-station in Maine. This transmission line is now being extended by the Maine Electric Power Company to the site of the Maine Yankee Atomic Power Station at Wiscasset, Maine, to provide a higher capacity link with a power pool composed of major New England power utilities.

These events, some recently concluded and others soon to happen, have given much greater significance to our energy exchange and power supply situation and to existing interconnections at present in operation with neighboring utilities.

The benefits arising from the sale of blocks of power to Maine utilities along with the respite in plant expansion occasioned by the decision to purchase power from Hydro-Quebec have provided very substantial economic advantages in a period of sharply rising fuel and operating costs.

Important new agreements were entered into during the year to supply power to the Power Commission of the City of Saint John and to the City of Edmundston.

Public ceremonies were held to mark the commissioning of the No. 1 unit of the Dalhousie Generating Station and, later in the year, to highlight the beginning of construction of the high voltage direct current converter station at Eel River.

The fiftieth anniversary of the creation of the Commission by Order-in-Council on July 6, 1920 was observed by many varied programmes. The programmes were conducted with high employee participation in all areas of the Province.

Members of The Commission, management, and staff participated in information meetings designed to give employees an appreciation of major projects under development by the Commission. These sessions, held in the evenings, were highly successful. Particular emphasis was given to the HVDC Converter Station with detailed presentations by the HVDC Project Group.

I wish to express my appreciation to members of The Commission for their fair-minded constructive support. In addition, I acknowledge with thanks the loyal and efficient contribution of management and staff at all times in making this report possible.

G. E. McINERNEY, Q.C.
Chairman

THE COMMISSION

Chairman
HON. GEORGE E. McINERNEY, Q.C.

Vice-Chairman
LOUIS E. LANDRY

Commissioners
MRS. OWEN SMITH
EDMOND LANDRY
HUGH MORRIS
JACK P. ENSOR
WILSON WELDON

Secretary of the Commission
P. J. BURNS

From left: P. J. Burns, Jack P. Ensor, Hugh Morris, Louis E. Landry, Hon. G. E. McInerney, Q.C., A. J. O'Connor, Mrs. Owen Smith, Edmond Landry, Wilson Weldon.

EXECUTIVE OFFICERS

General Manager
A. J. O'CONNOR

Assistant General Manager and Comptroller
P. O. BEATON

CHIEF ENGINEER
L. J. WHALEN

DIVISIONS

Services	H. V. DENYER
Design and Construction	G. H. D. GANONG
Production and Planning	F. C. MacLOON
Purchasing and Supply	B. J. MacMILLAN
Personnel	H. V. McINTYRE
Distribution	R. A. TONER
Treasurer	W. A. WILLIAMSON
Solicitor	A. McF. LIMERICK, Q.C.
Executive Assistant to the General Manager and Information Services	L. D. CORBETT

AUDITORS
TOUCHE ROSS & CO.

REVIEW OF OPERATIONS

FINANCE

SALES DURING THE YEAR INCREASED BY $7,065,402 AND AMOUNTED TO A TOTAL OF $55,101,439. THIS WAS AN INCREASE OF 14.7% COMPARED TO AN INCREASE OF 6.7% THE PREVIOUS YEAR.

The increase in total sales included large sales to New England utilities as a result of the completion, ahead of schedule, of the new 345 KV transmission line to the international border.

Operational costs of generation increased considerably due to a 59.4% increase in thermal generation and increases in the cost of fuel. A full year's operation of the new 100,000 kilowatt unit in the Dalhousie Generating Station contributed greatly to the much larger overall generation.

Water flows during the year were slightly below normal and it was necessary to take $616,500 from the water equalization fund and credit it to operations.

The surplus before appropriations was $4,232,046 of which $2,976,500 was added to the water equalization account with $200,000 being added to the Insurance Fund and $500,000 to Contingencies and Rate Stabilization. The remaining $555,546 was carried forward to the Surplus Account.

The remaining capital jobs, financed under the Atlantic Provinces Power Development Act, were completed and the final payment on long term debt to the Northern Canada Power Commission is due in 2011.

During August 1970, an issue of $10,000,000—9% debentures was issued in Canada. The term is 5 years with the option in 1975 for the holder to exchange them for 9% debentures due August 1, 1990.

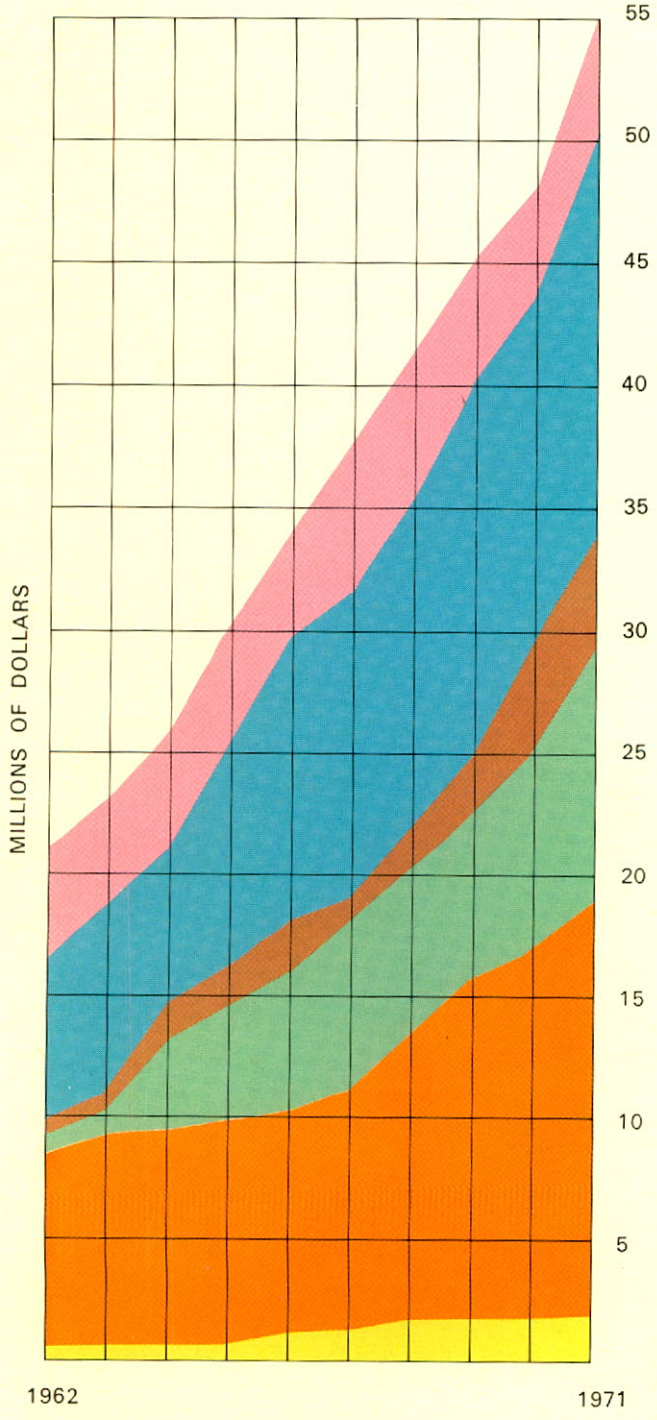
In addition to the above, the larger sales to New England as well as purchases over our interconnection have provided extra funds to meet, in part, our needs for capital expenditures. The present bank credits have permitted a degree of flexibility which has been to the advantage of the Commission in planning and making the best use of the cash flow.

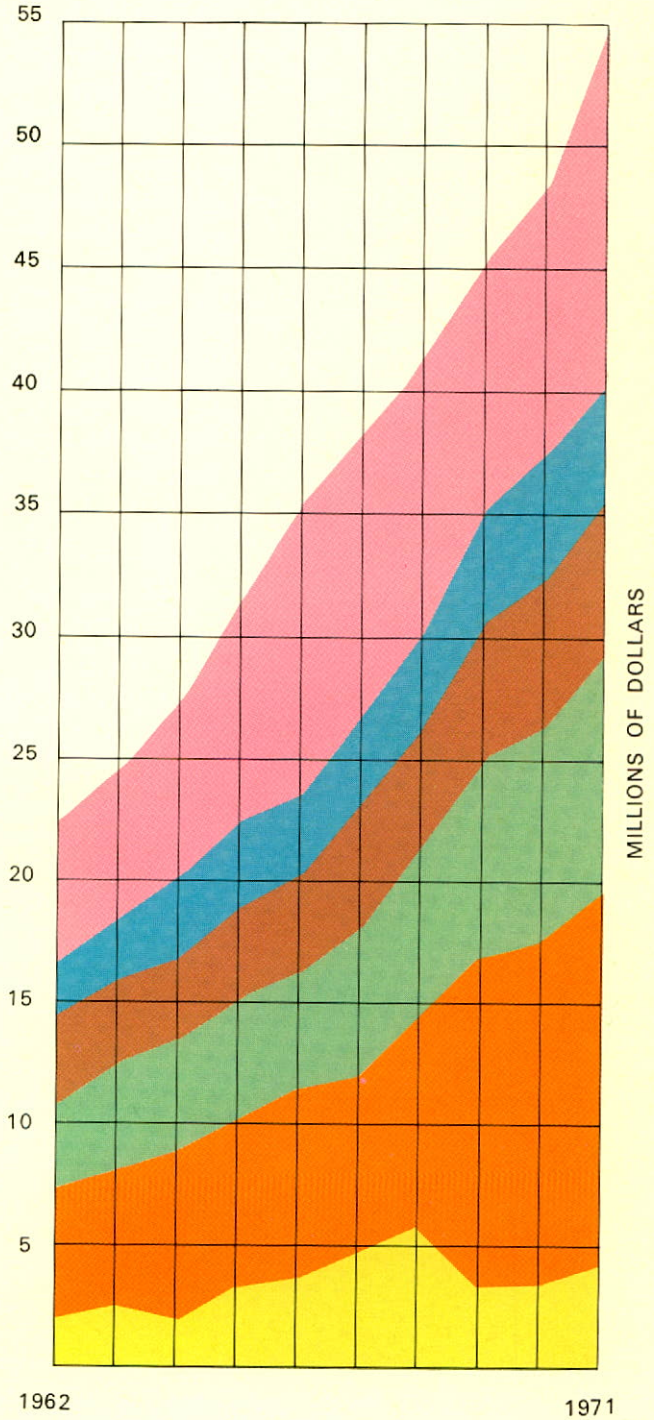
SOURCES OF REVENUE
As at March 31, 1971

Wholesale	8.2%
Industrial	30.2%
Interconnections	8.4%
Commercial & Street Lighting	19.2%
Retail	30.4%
Steam & Miscellaneous	3.6%

DISTRIBUTION OF REVENUE
As at March 31, 1971

26.3%	Generation & Purchases
8.8%	Transmission & Distribution
11.5%	Administration
18.1%	Depreciation
27.6%	Interest
7.7%	Transferred to Reserves & Surplus





NOTE: In 1964 a commercial rate according to accepted definition was established and transfers to applicable rates were made during the years 1964-1966. Since then the usual classifications have been used.

OPERATIONS

System firm peak demand reached 604,600 kilowatts on December 22, 1970 and a gross peak of 967,500 kilowatts was recorded on December 15, 1970.

The Commission's system firm peak demand has been compounding at a higher rate than the national average. It has increased 3.44 times since a high of 175,900 kilowatts was reached in December 1960. The compound growth rate over this period was 13.1%.

Gross generation from all plants totalled 4,651,172,636 kilowatt hours, an increase of over 500 million kilowatt hours or 12.1% over the preceding fiscal year. Generation was divided roughly between hydro and thermal plants: 2,203,940,500 kilowatt hours hydro, 2,439,835,600 kilowatt hours thermal; and 7,396,536 kilowatt hours from diesel plants.

Purchases of power totalled 96,640,963 kilowatt hours, an increase of 98.6% over the preceding period.

The major part of the purchased kilowatt hours originated in Nova Scotia with the remainder coming principally from in-house generating facilities of New Brunswick industries.

During the last three months of the fiscal year, January 1 to March 31, 1971, the Commission purchased 50 megawatts at 85% monthly load factor from the two Nova Scotia utilities under a firm capacity and energy agreement.

Under further agreements with the two companies, the Commission will purchase 110 MW in the period, August 1, 1971 to October 31, 1971; 25 MW during the period, November 1, 1971 to March 31, 1972; 50 MW during the period August 1, 1972 to October 31, 1972. All these amounts of power are at the same monthly load factor of 85% and are surplus to the requirements of Nova Scotia systems during these periods.

Interconnection sales to utilities outside the Province increased 28.1% to a total of 824,993,548 kilowatt hours.

Following the completion of construction of the 345 KV transmission line to the international border, the interconnecting facilities to the Maine Electric Power Company were placed in service October 1, 1970 some two months ahead of schedule. During these two months, the tie was operated at 138,000 volts at the Keswick Terminal and 115,000 volts at the Orrington Substation near Bangor, Maine. No transformation was used in this exchange and the transmission line was loaded as high as 125,000 kilowatts. The transmission line was stepped up to its full voltage of 345,000 volts on December 1, 1970.

A world-wide shortage of heavy fuel oil combined with increased transportation charges due to tanker shortages resulted in substantial increases in fuel prices early in the year. These price increases were minimized in the fiscal year 1970-71 by firm contracts for a portion of the Commission's requirements.

River flows during the year were less than average resulting in less than expected hydraulic generation.

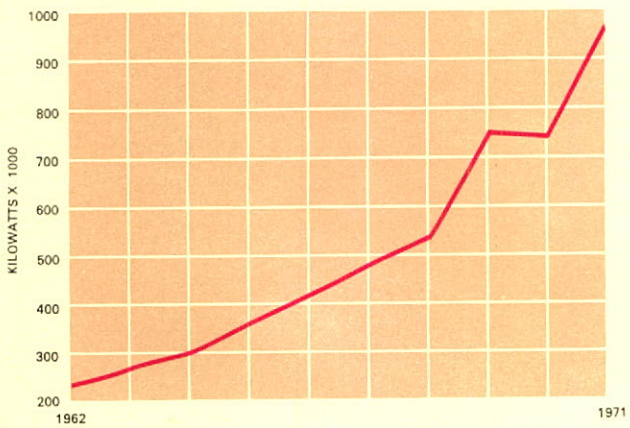
Energy distributed from the distribution system (excluding losses, wholesale, and transmission line sales but including Commission use in Branches) increased by 12.7% to 1,341,877,200 kilowatt hours.

A billing pilot project to research a more economical means of reading meters and billing was conducted in the Sussex area for a four-month period starting in August 1970. About 900 customers participated in this project. A method of billing was introduced called "Interim Billing" consisting of a computer-estimated bill one month, based on billing history and an actual meter reading for the bill on the second month. The sequence was repeated the next two months.

Customers were kept informed of the reasons and progress of the project and reacted very positively. The results of the project are being studied closely.

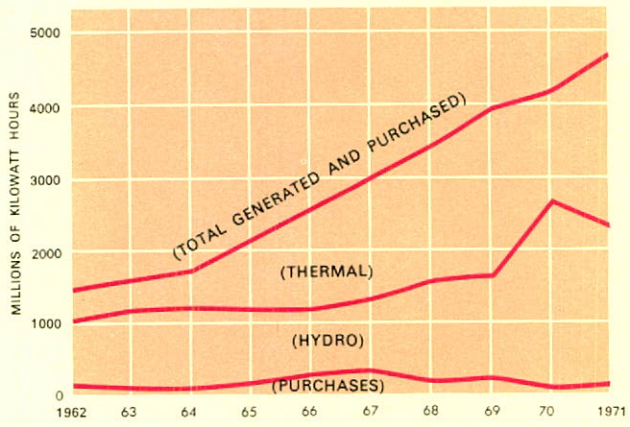
Figures are for fiscal years ending March 31.

POWER REQUIREMENTS AND EQUIVALENT RATE OF GROWTH



RATE OF GROWTH 15.1%
compounded over period shown

KILOWATT HOURS GENERATED AND PURCHASED



An aerial view of NB Power's High Voltage Direct Current Converter Station at Eel River in northern New Brunswick showing Chaleur Bay and the province of Quebec in the background.

STATEMENT OF GENERATION AND SALES
FOR THE FISCAL YEAR ENDED 31 MARCH 1971

	1971 Kilowatt Hours	1970 Kilowatt Hours	Difference Kilowatt Hours	%
GENERATION				
Hydro	2,203,940,500	2,615,497,300	− 411,556,800	− 15.7%
Thermal	2,439,835,600	1,526,031,000	+ 913,804,600	+ 59.9%
Diesel	7,396,536	6,241,280	+ 1,155,256	+ 18.5%
Purchases	96,640,963	48,661,620	+ 47,979,343	+ 98.6%
Gross Generation and Purchases	4,747,813,599	4,196,431,200	+ 551,382,399	+ 13.1%
Station Service	141,106,255	106,472,360	+ 34,633,895	+ 33.0%
Net Generation and Purchases	4,606,707,344	4,089,958,840	+ 516,748,504	+ 12.6%
Losses—Transformer and Transmission	228,337,189	244,181,880	− 15,844,691	− 6.5%
Losses—% of Net Generation and Purchases	5%	6%		
Total Energy Distribution	4,378,370,155	3,845,776,960	+ 532,593,195	+ 13.8%
SALES				
Wholesale	335,878,098	307,735,880	+ 28,142,218	+ 9.1%
Interconnections	824,993,548	643,925,600	+ 181,067,948	+ 28.1%
Industrial Power	1,965,618,738	1,821,594,010	+ 144,024,728	+ 7.9%
Commercial (11,495 Customers)	435,764,564	364,817,590	+ 70,946,974	+ 19.4%
Residential (138,213 Customers)	679,778,600	607,267,900	+ 72,510,700	+ 11.9%
Average Revenue Per Commercial KWH	2.09¢	2.21¢		
Average Revenue per Residential KWH	2.44¢	2.54¢		
KWH Per Residential Customer	4,918	4,619	+ 299	+ 6.5%
Street Lights	22,547,346	19,621,140	+ 2,926,505	+ 14.9%
Total Sales	4,264,580,894	3,764,962,120	+ 499,618,774	+ 13.3%
Station and Internal Use	174,419,278	123,226,870	+ 51,192,408	+ 41.5%
Total Losses	308,813,427	308,242,200	+ 571,217	+ .2%
Gross Generation and Purchases	4,747,813,599	4,196,431,200	+ 551,382,399	+ 13.1%

SALES AT A GLANCE

Total firm sales increased by 325,610,859 kilowatt hours or 12.4%.

Customers (all classes) now number 151,989, an increase of 5.0% over last year.

Average annual kilowatt hour consumption per residential customer increased by 6.5% to 4,918 kilowatt hours.

Electrically heated dwelling units reached 2,703 by the end of the fiscal year, 1,806 individual homes and 897 apartments.

"Cascade" electric water heater rental installations increased by 4,507 units, as compared to 4,375 last year.

"Sentinel" dusk-to-dawn light rentals now number 7,287, an increase of 27%.

Interconnection sales to other utility systems increased by 28% to 824,993,548 kilowatt hours.

SALES

One of the highlights of the year was the significant increase in electric space heating. At the end of the fiscal year all-electric homes and apartments totalled 2,703 of which 1,806 were all-electric individual homes.

Many other all-electric installations continued to be connected to the Commission's system in every area of the Province. These included schools, motels, restaurants, stores and offices. A total-electric shopping centre was officially opened in the new Town of Nackawic. A new electrically climate controlled civic complex has begun construction in Moncton, consisting of a twenty storey office tower, housing the new city hall, a ten storey convention hotel, a shopping complex and parking facilities for 450 cars. A continent-wide chain has also constructed an all-electric four storey convention motel in Moncton.

The farm sector of the New Brunswick economy continued to make greater use of electrical energy, particularly in poultry raising.

In the residential area, sales resulted in average annual consumption per customer of 4,918 kilowatt hours, an increase of 6.5% over the preceding year.

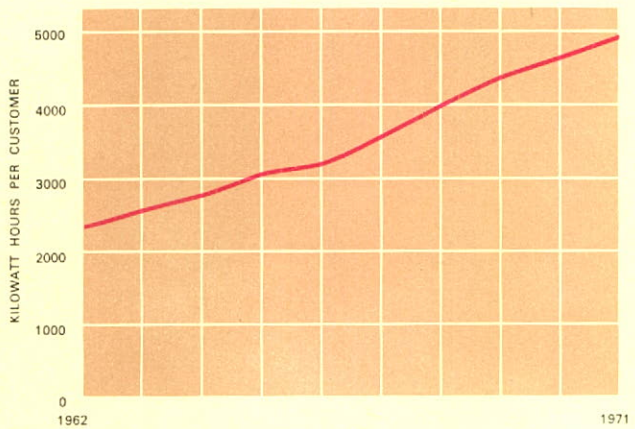
Industrial power users increased in number, adding considerably to the demand for power. Among the major new loads was a chemical plant and a major bulk oil storage facility at Saint John, a new base metal mine and concentrator near Bathurst, a food-processing plant at Grand Falls and, in the pulp and paper industry, two new mills—one at Nackawic, one near St. George, in addition to a particle board plant near Chatham.

Firm sales of electric energy increased by 325,610,859 kilowatt hours or 12.4% during the year.

Contributing to the above growth were the Commission's Home Wiring Finance, "Cascade" water heater and "Sentinel" Dusk-to-Dawn light rental plans. Rental water heater installations increased by 4,507 to a total of 27,877 and Dusk-to-Dawn lights by 1,543 to a total of 7,287.

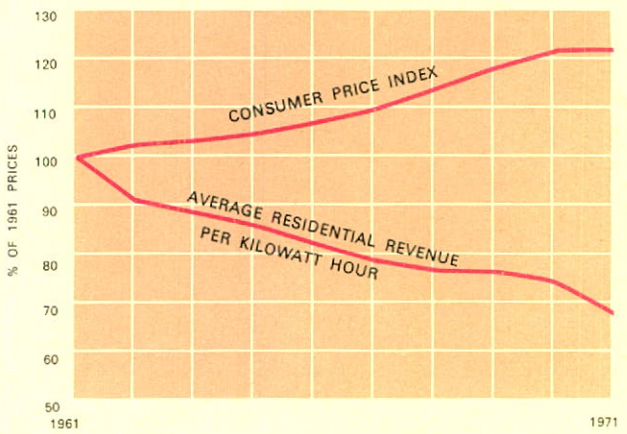
Figures are for fiscal years ending March 31.

ANNUAL RESIDENTIAL CONSUMPTION



Average usage per residential customer has more than doubled in 10 years, at a rate well in excess of the national average.

AVERAGE RESIDENTIAL REVENUE COMPARED WITH CONSUMER PRICE INDEX



The economy of operation and increased usage has reduced the unit cost of electricity to residential customers by almost 50% in 10 years.

NOTE — 1962 is not shown on chart.

CAPITAL ADDITIONS

Work continued during the year on the fourth unit of the Mactaquac Generating Station. Contract administration for the 100,000 kilowatt unit included the turbine foundations, penstock, scrollcase installation and concrete encasement. On-line operation of the unit is scheduled for April 1972.

Plant design and specifications were prepared for the installation of a gas turbine in the Moncton area, featuring synchronous condenser capability, quick-start and remote operation from the System Operating Centre in Marysville. The primary purpose of the unit is to provide voltage control in the southeastern part of the Province through synchronous condenser operation of the generator approximately 95% of the time. The other 5% of the time, the turbine may come into operation to add support to Commission generating facilities and increase reliability to the area during periods of peak demand or when maintenance is being carried out on major transmission lines or generating units. First commercial operation is planned for late 1971.

At Eel River in northern New Brunswick, a major project of the Commission is underway. A 320,000 kilowatt high voltage direct current converter station is being constructed to provide an asynchronous interconnection between the systems of Hydro-Quebec and NB Power. The converter station will facilitate purchases of blocks of Churchill Falls power surplus to the Quebec system and contracted for the period 1972 to 1976.

One of the exclusive features of a high voltage direct current converter scheme applies to the interconnection of power systems so that disturbances on either system are not propagated to the other system. This feature will be utilized at Eel River to permit power to flow between the two systems in either direction in a precisely controlled manner.

It has been recognized for some time that system stability requirements have precluded certain large systems on the North American Continent from effecting interconnections in the usual sense between their system and those of their neighbors.

The Eel River HVDC station, planned for operation in 1972, will be unique in this hemisphere and the largest converter station in the world using the solid state technique.

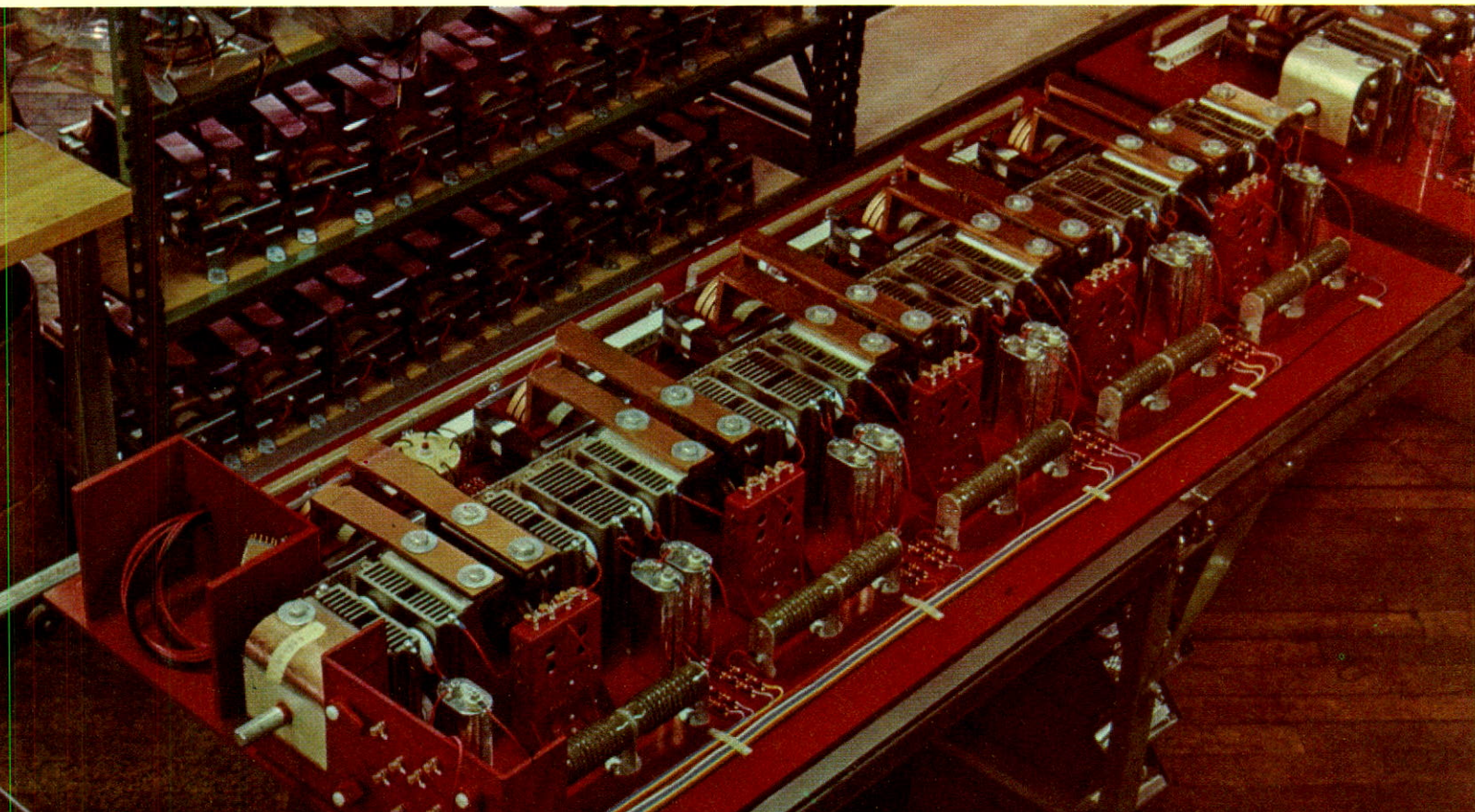
Although no new generating capacity was added to the system during the year, construction of capital projects continued at a brisk pace. The Commission's first 345,000 volt transmission line was completed from the Keswick Terminal to the international border. The first 230,000 volt Gulfport-type transmission line was completed from Keswick Terminal to Moncton Terminal; 138,000 volt lines were also completed from Grand Falls to Edmundston and from Brunswick Mines to Anaconda Mines; 230,000 volt lines were begun from Bathurst to Eel River Terminal to the Quebec Border.

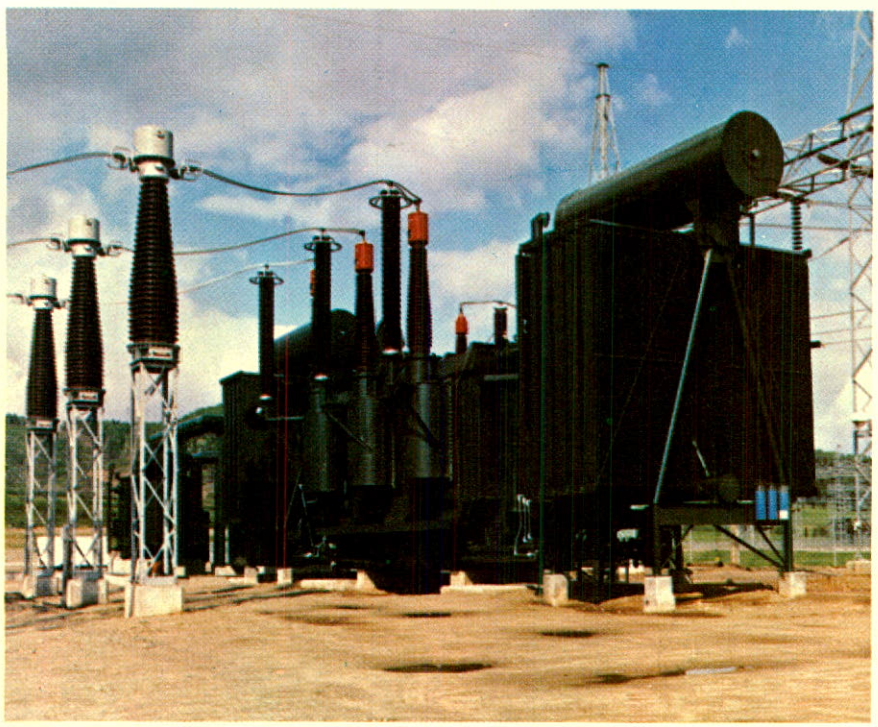
The major terminal station project completed during the year was the 345,000 volt station at Keswick. The large 230,000 volt station at Eel River and the 230,000 volt station at Bathurst were major projects begun during the year. Additions were also designed for Edmundston, Grand Falls, Courtenay Bay, Moncton, and Mactaquac Stations.

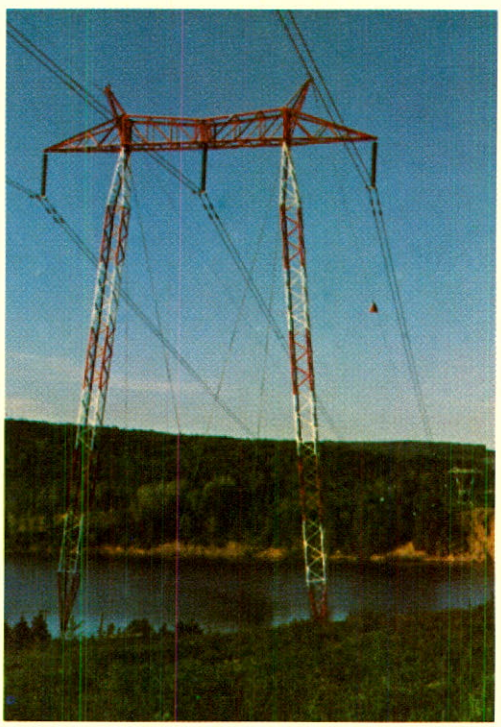
Substation work included new stations, major rebuilds of industrial stations, and lesser rebuild of feeder substations, and the auxiliary distribution lines and extensions to new customers.

In all, a capital program of nearly $22 million was carried out for additional facilities at generating stations, distribution facilities and services, transmission lines, terminal stations, equipment and miscellaneous construction.

The building of the HVDC Converter Station brought about many innovations in electrical equipment manufacturing. Pictured here is some of the new type equipment that is being installed. It is the first commercial HVDC facility in the world to use solid state valves.







PLANNING

The additional generation required to meet the system's expected load growth for the next five and one-half years will come primarily from contracted purchases from Hydro-Quebec. The purchased generation from Hydro-Quebec will, in effect, be combined with system generation to meet sales and to maintain the required level of reserve during the period.

Supplemental generation for this short range interval will come from seasonal purchases during the 1971-72 period, the installation in the fall of 1971 of a 25,000 KVA gas turbine/synchronous condensor in the Moncton area, the addition of a fourth 100,000 KW unit in April 1972 at the Mactaquac Generating Station and by a further increase in output of this station as a result of a three foot increase in its operating head.

Following the termination of the existing purchase contract with Hydro-Quebec, it is planned that demands will be met principally by thermal units in the 300,000 to 500,000 kilowatt size. The installation of units in this size range has been made possible as the result of the major interconnections with Hydro-Quebec and New England.

Tenders for the first unit in the 300,000 kilowatt size have been called. It is scheduled to be fully commissioned by November, 1976. An additional unit of similar size is planned for operation prior to the end of the decade, possibly as early as 1978.

During this period, units five and six at the Mactaquac Generating Station will be installed, bringing this development to its ultimate capacity of some 600,000 kilowatts. Additional generation on the St. John River is under consideration, particularly at Grand Falls Generating Station, and further development of water storage in the St. John River drainage area is being studied.

Long-term generation planning for the system also includes evaluation of possible purchase and sales contracts with other systems. Appraisals will be made of generation sources such as nuclear or tidal power as their cost may be influenced by trends in the movement of interest rates, cost of fossil fuels and cost of environmental protection to make them competitive in our system as energy producers.

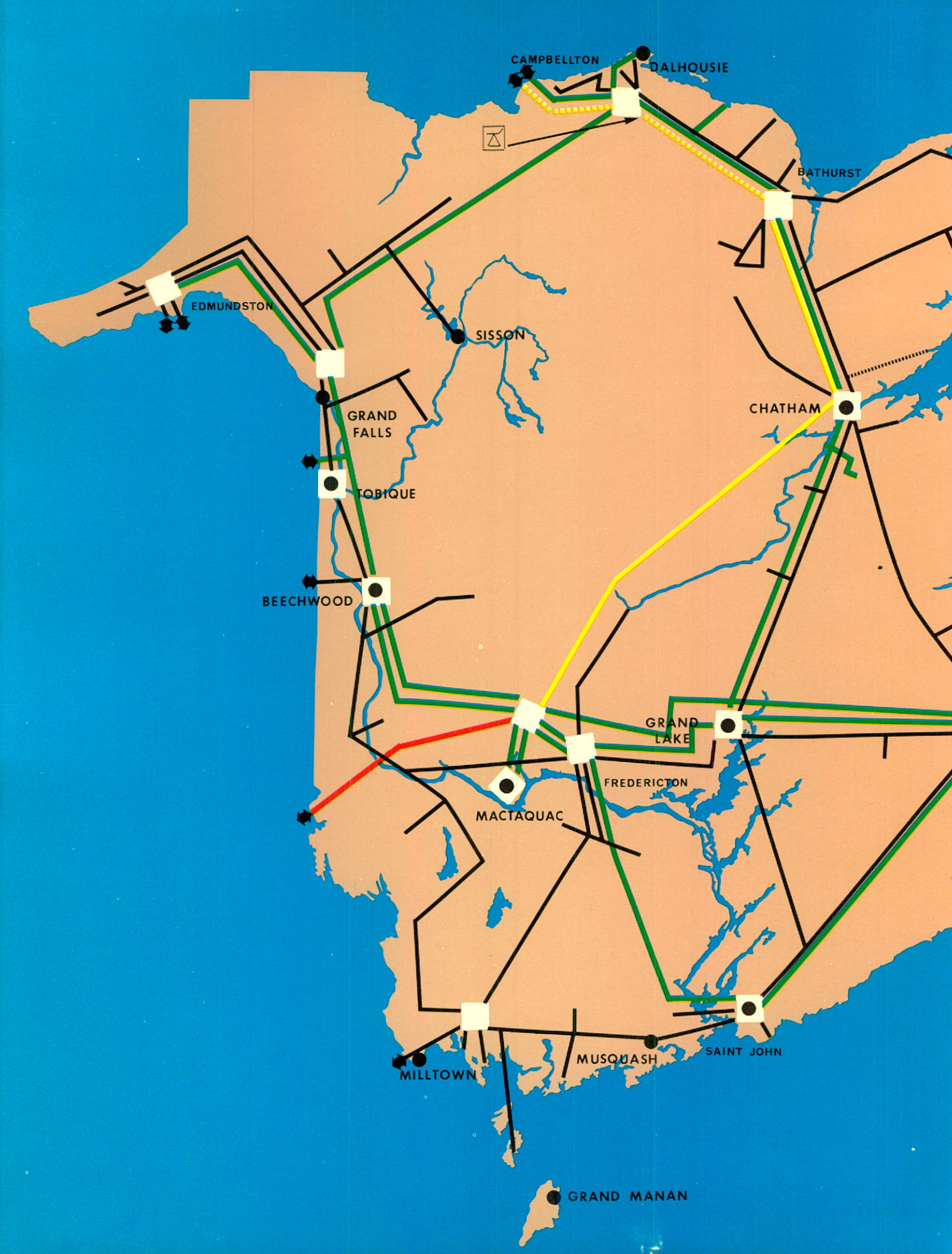
The exact timing of further base load thermal units will, to a great extent, be determined by the generation patterns and load-resource balance of our interconnected systems. The future looks bright indeed for large oil-fired generating plant located on the south coast of New Brunswick with its 120 foot depth of water off-shore.

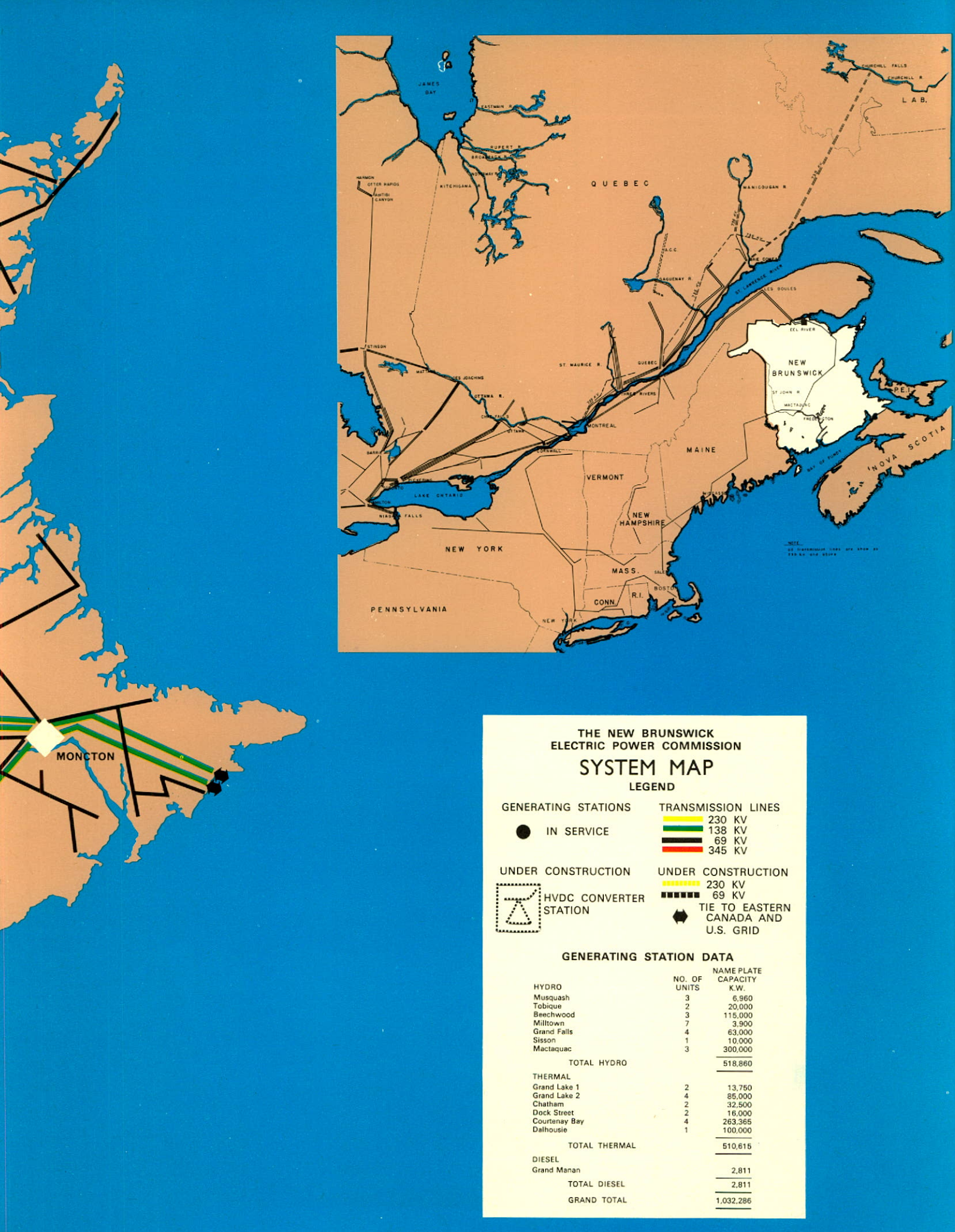
Based on the in-province expected system load growth and generation expansion, the transmission network will be upgraded with the completion of 230,000 volt lines to all major load and generation centres. A larger proportion of load will be served directly from the 138,000 volt transmission system rather than the 69,000 volt network.

Night view of Mactaquac Hydro Electric Generating Station. A fourth unit now being installed will bring this station's capacity to 400,000 kilowatts. Ultimate capacity of the station is 600,000 kilowatts.

View of the largest transformer ever built in Canada and now installed at NB Power's Keswick Terminal Station.

View of 345 KV line running from Keswick Terminal to the Maine Boundary at Monument Brook. This photo was taken at Meductic with a view of the Mactaquac Head Pond.


CAMPBELLTON
DALHOUSIE
BATHURST
EDMUNDSTON
SISSON
GRAND FALLS
CHATHAM
TOBIQUE
BEECHWOOD
GRAND LAKE
FREDERICTON
MACTAQUAC
MUSQUASH
SAINT JOHN
MILLTOWN
GRAND MANAN



THE NEW BRUNSWICK
ELECTRIC POWER COMMISSION

SYSTEM MAP

LEGEND

GENERATING STATIONS

- IN SERVICE

TRANSMISSION LINES

- 230 KV
- 138 KV
- 69 KV
- 345 KV

UNDER CONSTRUCTION

- HVDC CONVERTER STATION

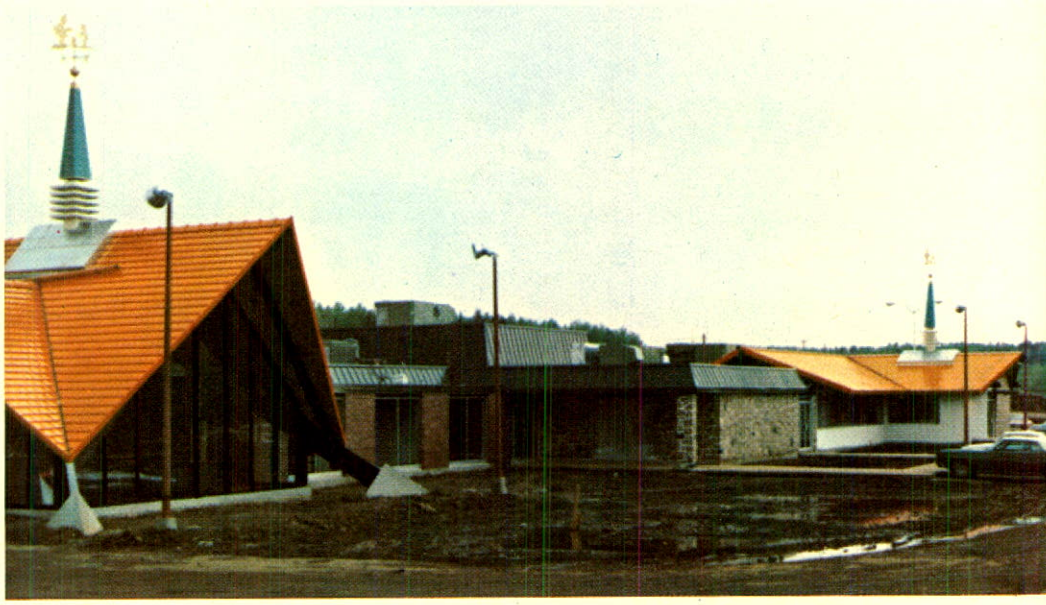
UNDER CONSTRUCTION

- 230 KV
- 69 KV
- TIE TO EASTERN CANADA AND U.S. GRID

GENERATING STATION DATA

	NO. OF UNITS	NAME PLATE CAPACITY K.W.
HYDRO		
Musquash	3	6,960
Tobique	2	20,000
Beechwood	3	115,000
Milltown	7	3,900
Grand Falls	4	63,000
Sisson	1	10,000
Mactaquac	3	300,000
TOTAL HYDRO		518,860
THERMAL		
Grand Lake 1	2	13,750
Grand Lake 2	4	85,000
Chatham	2	32,500
Dock Street	2	16,000
Courtenay Bay	4	263,365
Dalhousie	1	100,000
TOTAL THERMAL		510,615
DIESEL		
Grand Manan		2,811
TOTAL DIESEL		2,811
GRAND TOTAL		1,032,286

Night view of the Saint John Harbour Bridge illustrating an exemplary use of flood-lighting.



The majority of motels in New Brunswick have adopted the all-electric concept. Exterior view of modern, all-electric motel recently opened in Moncton.

Fredericton's new all-electric high school—one of the many throughout the province that has adopted an all-electric installation.

STAFF

Negotiations between the Commission and Local 1733, IBEW were opened on November 16, 1970 and ended on January 18, 1971 with no agreement reached. Following this, both parties attended before the Public Service Labour Relations Board to aid in determining the number of "designated employees", that is, union employees designated as operating staff in the event of a legal strike.

Both parties prepared submissions to a Conciliation Board, which will report to the Public Service Labour Relations Board on or before June 10, 1971.

An extensive job evaluation program was also begun during the year. Seven representatives of the major divisions of the Commission have been appointed to carry out the programme, working under a term of reference pertaining to all Divisions.

The Commission carried out extensive salary surveys during the year to assist in negotiating a new operating labor contract, replacing one which expired on December 31, 1970. Data was obtained from comparable electric utilities and companies as well as provincial and municipal government jurisdictions within and outside the Atlantic Provinces.

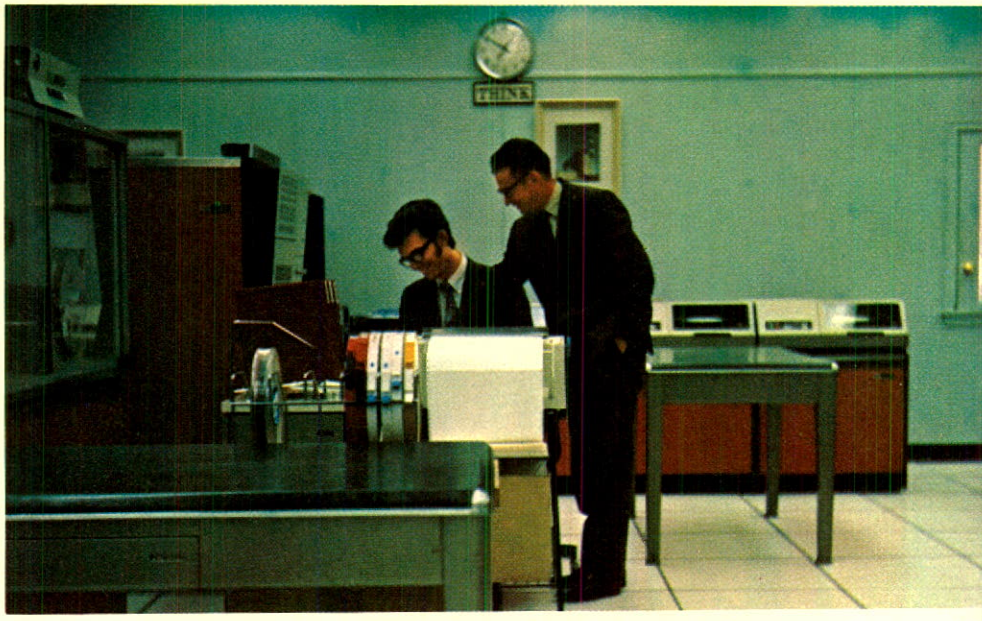
In terms of career development and vocational upgrading of employees, numerous in-company and external courses on staff development and trades training were made available.

Manpower productivity has continued to improve through changes in methods of work, new equipment, retraining programs, and area reorganization. Regular and temporary staff of the Commission totalled 1,478 as of March 31, 1971 compared to 1,494 on March 31, 1970. This year's total continues a downward trend since a high of 1,731 regular and temporary employees was reached early in 1967 during the construction of the Mactaquac Plant.

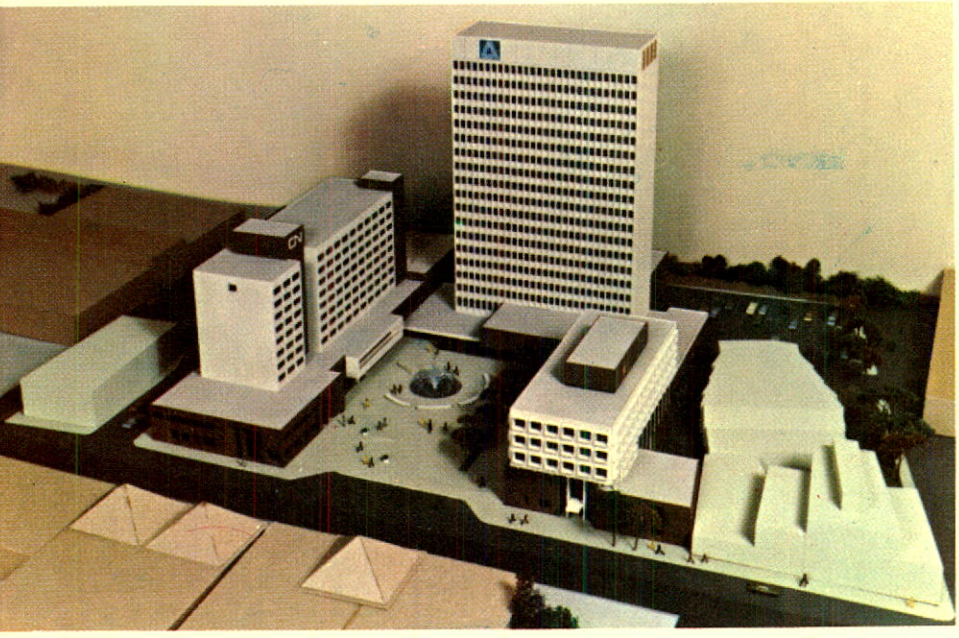
G. E. McINERNEY, Q.C.
Chairman

A. J. O'CONNOR
General Manager

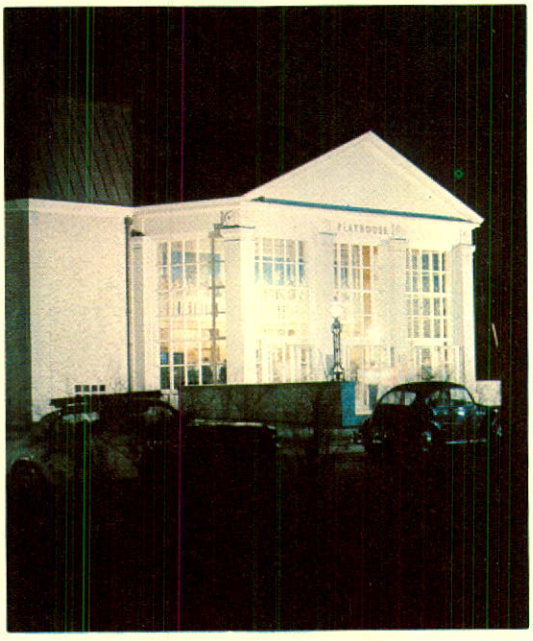
NB Power's 25 Year Club recognizes years of service rendered by employees. This photo shows Assistant General Manager P. O. Beaton presenting a quarter century award to Jacques Theriault.



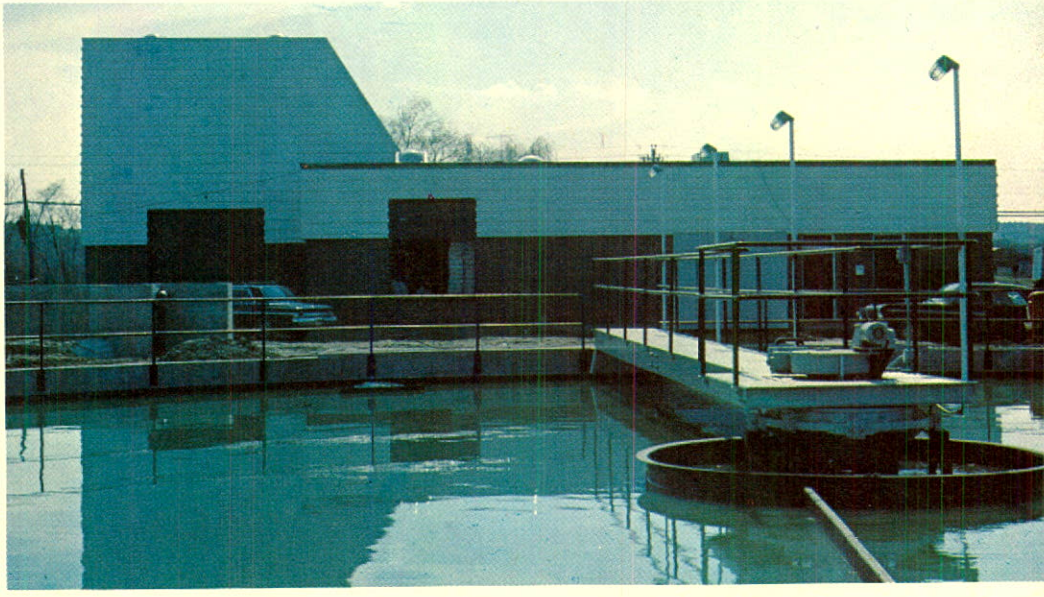
Many operations at NB Power are now computerized. New computer uses are being applied on a continuing basis.



Mock-up of New Brunswick's largest all-electric, climate-controlled complex. Now a-building, the Moncton Civic Centre, housing the new City Hall, will consist of a 14 storey office building, hotel convention centre and shopping mall.



Night view of Fredericton's Playhouse, one of New Brunswick's drama centres. Its fine architecture aptly lends itself to flood-lighting.



Environmentally conscious New Brunswick seeks to preserve its natural surroundings. Photo shows sewage treatment centre serving greater Fredericton.

TOUCHE ROSS & CO.

BRUNSWICK HOUSE
44 PRINCE WILLIAM STREET
P.O. BOX 549, SAINT JOHN, N.B.
(506) 657-5240

AUDITORS' REPORT

The Honourable Richard B. Hatfield,
Premier of the Province of New Brunswick,
Fredericton, N.B.

Sir:

We have examined the balance sheet of The New Brunswick Electric Power Commission as at 31 March 1971 and the related statements of operations and surplus and source and application of funds for the year then ended. Our examination included a general review of the accounting procedures and such tests of accounting records and other supporting evidence as we considered necessary in the circumstances.

In our opinion, these financial statements present fairly the financial position of the Commission as at 31 March 1971 and the results of its operations and the source and application of its funds for the year then ended, in accordance with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

Touche Ross & Co.

Chartered Accountants.

Saint John, N.B.
June 18, 1971.

THE NEW BRUNSWICK ELECTRIC POWER COMMISSION

BALANCE SHEET AS AT 31 MARCH 1971

ASSETS

	1971		1970	
FIXED ASSETS				
Land, buildings, plant and equipment at cost, less accumulated depreciation (Schedule 1)		$326,572,946		$320,233,493
CURRENT ASSETS				
Cash and short-term investments	$12,236,798		$15,997,302	
Accounts receivable	10,052,239		6,582,362	
Due from Northern Canada Power Commission	—		313,209	
Material, supplies and fuel, at cost	2,841,733		3,005,720	
Prepaid expenses	355,425		277,407	
		25,486,195		26,176,000
Mortgages and Deferred Accounts Receivable		524,443		406,350
DEFERRED CHARGES				
Debenture discount and issue expenses, less amounts amortized	4,440,264		4,651,692	
Survey and engineering expense in connection with expansion of facilities	840,948		789,296	
		5,281,212		5,440,988
INSURANCE FUND				
Cash and investments, at cost		1,452,561		1,296,978
		$359,317,357		$353,553,809

ON BEHALF OF THE NEW BRUNSWICK ELECTRIC POWER COMMISSION:

G. E. McINERNEY, Chairman

LOUIS E. LANDRY, Vice-Chairman

LIABILITIES

	1971		1970	
FUNDED DEBT				
Debentures issued by the Commission guaranteed by the Province of New Brunswick (Schedule 2)		$214,651,564		$207,980.609
LOANS FROM THE PROVINCE OF NEW BRUNSWICK				
(Schedule 3)		28,406,690		33,950,131
LOANS FROM NORTHERN CANADA POWER COMMISSION				
For capital expenditures on approved projects as provided under the Atlantic Provinces Power Development Act (Schedule 4)		61,709,140		60,941,479
CURRENT LIABILITIES				
Accounts payable and accruals	$14,665,835		$13,617,468	
Accrued interest on debentures issued by the Commission	4,280,426		4,268,992	
Province of New Brunswick—Accrued interest	446,260		530,681	
Other	13,552		90,395	
Holdbacks on contracts in progress	430,457		1,118,483	
Service deposits	370,406		307,891	
		20,206,936		19,933,910
DEFERRED—Contributions from customers in aid of construction, repayable over a period of years in accordance with terms of agreements		506,441		392,164
RESERVES (Schedule 5)		27,980,722		25,055,198
SURPLUS		5,855,864		5,300,318
		$359,317,357		$353,553,809

NOTES TO FINANCIAL STATEMENTS
AS AT 31 MARCH, 1971

1. The Commission received a claim in February 1968 from Mactaquac Constructors (a joint venture) for additional costs in the provisional total of $8,315,026 in connection with the Mactaquac Hydro Electric Development project. The amount was subsequently increased on 8 April 1969 to $10,276,844 after submission of the claim by the Contractor to arbitration under the contract. The hearings before the arbitrators were commenced on 21 April, 1969. On 8 May, 1969 a further amendment to the claim was received which increased the amount to $16,871,548. After detailed studies by engineering consultants to the Commission and the Engineer under the contract, it appears that some part of the original claim may be valid but the Commission is of opinion that the major part of the claim and particularly the latter revision upward in the quantum of claim are not only inflated, but have little or no merit. An amount has been recorded in the accounts which the Commission considers will be sufficient to provide for any settlement resulting from arbitration.
2. The unexpended balance of approved capital expenditures at 31 March, 1971 amounted to approximately $33,871,355.

THE NEW BRUNSWICK ELECTRIC POWER COMMISSION

STATEMENT OF OPERATIONS AND SURPLUS

For the Year Ended 31 March 1971

	1971			1970		
Sales of power, less discounts						
Wholesale		$ 4,507,277			$ 4,118,458	
Industrial		16,657,877			14,961,979	
Interconnections		4,629,764			2,681,174	
Street lighting		1,418,622			1,169,014	
Commercial		9,135,193			8,063,000	
Retail		16,767,287			15,431,889	
		53,116,020			46,425,514	
Sales of steam		1,015,903			927,180	
Miscellaneous income		969,516			683,343	
			$55,101,439			$48,036,037
Expenditure						
Purchased power	$ 752,614			$ 213,497		
Operating and maintenance expenses						
Generation	14,325,978			10,319,087		
Transmission	537,605			787,528		
Distribution	4,313,515	19,929,712		4,466,289	15,786,401	
Administrative and other expenses, less amounts capitalized		6,368,458			5,834,572	
Interest, exchange and amortization of debenture discount and expenses	18,427,657			17,481,195		
Less income from sinking fund assets	1,375,745			1,260,826		
	17,051,912			16,220,369		
Less amounts capitalized	1,831,594	15,220,318		2,045,955	14,174,414	
Provision for depreciation of buildings, plant and equipment		9,967,405	51,485,893		8,794,562	44,589,949
Surplus for the year before adjustment for water storage equalization			3,615,546			3,446,088
Adjustment to equalize generation costs due to fluctuation in water storage levels			616,500			(240,000)
Surplus for the year			4,232,046			3,206,088
Appropriations of surplus to reserves for						
Water storage equalization		2,976,500			2,300,000	
Insurance		200,000			—	
Contingencies and rate stabilization		500,000	3,676,500		400,000	2,700,000
Balance added to surplus account			555,546			506,088
Surplus at beginning of year			5,300,318			4,794,230
Surplus at end of year			$ 5,855,864			$ 5,300,318

THE NEW BRUNSWICK ELECTRIC POWER COMMISSION

STATEMENT OF SOURCE AND APPLICATION OF FUNDS

For the Year Ended 31 March 1971

	1971	1970
SOURCE OF FUNDS		
From operations		
Surplus for the year	$ 4,232,046	$ 3,206,088
Amounts charged against operations but not requiring outlay of funds:		
Provision for		
Depreciation of buildings, plant and equipment	9,967,405	8,794,562
Vehicle depreciation	546,437	621,442
Amortization of debenture discount and expenses	383,859	364,410
Adjustment to equalize generation costs due to fluctuation in water storage levels	(616,500)	240,000
Survey and engineering expenses written off	66,645	149,050
	14,579,892	13,375,552
Proceeds from debentures issued less discount and expenses	9,827,569	13,214,812
Loans from Northern Canada Power Commission	1,496,769	6,093,695
Insurance fund investment income	83,310	73,772
Repayment of mortgages and deferred accounts receivable—net	—	83,394
Contributions from customers in aid of construction—net	114,277	324,939
Decrease in working capital	962,831	—
	$ 27,064,648	$ 33,166,164
APPLICATION OF FUNDS		
Expenditure on fixed assets	$ 16,853,294	$ 19,526,449
Sinking fund instalments	486,486	2,327,226
Reduction in loans from		
Province of New Brunswick	8,386,000	5,662,000
Northern Canada Power Commission	729,108	547,086
Premium on debentures redeemed in United States dollars	67,945	185,790
Deferred survey and engineering expenses	118,297	402,170
Increase in insurance fund	155,583	1,562
Increase in mortgages and deferred accounts—net	118,093	—
Expenditures charged to reserves		
Loss on disposal insurance fund investments	77,727	—
Storm damage	—	125,591
Self-insured damages	50,000	57,765
Miscellaneous	22,115	19,857
Increase in working capital	—	4,310,668
	$ 27,064,648	$ 33,166,164

THE NEW BRUNSWICK ELECTRIC POWER COMMISSION

BALANCE SHEET SCHEDULES

As at 31 March 1971

SCHEDULE 1—FIXED ASSETS—AT COST

	1971	1970
Land, buildings, plant and equipment		
Power generating stations	$ 261,344,582	$ 260,084,399
Transmission system	49,955,172	41,767,450
Substations	32,685,787	30,139,051
Distribution system	60,307,786	57,029,505
Other properties	4,513,135	4,509,252
Communications equipment	671,767	584,559
Motor vehicles and miscellaneous equipment	5,111,817	4,852,837
	414,590,046	398,967,053
Construction in progress	13,032,229	10,490,700
	427,622,275	409,457,753
Less grants from Government of Canada	22,500,000	20,000,000
	405,122,275	389,457,753
Less accumulated depreciation	78,549,329	69,224,260
	$ 326,572,946	$ 320,233,493

SCHEDULE 2—SINKING FUND DEBENTURES ISSUED BY THE COMMISSION

	1971	1970
Principal and interest payable in Canadian funds		
8½% maturing 15 October 1974 (exchangeable at the option of the holder to 15 April 1974 for 8½% debentures maturing 15 October 1989)	$ 8,000,000	$ 8,000,000
9 % maturing 1 August 1975 (exchangeable at the option of the holder to 1 August 1975 for 9% debentures maturing 1 August 1990)	10,000,000	—
5½% maturing 15 March 1987	2,650,000	2,650,000
5½% maturing 1 November 1988	2,000,000	2,000,000
5¾% maturing 1 July 1991	5,000,000	5,000,000
5½% maturing 15 March 1992	7,350,000	7,350,000
5½% maturing 1 November 1993	6,000,000	6,000,000
5½% maturing 15 June 1994	10,000,000	10,000,000
5½% maturing 31 December 1994	3,790,000	3,790,000
6¼% maturing 1 May 1995	15,000,000	15,000,000
5¾% maturing 15 October 1995	7,500,000	7,500,000
6 % maturing 1 January 1996	13,800,000	13,800,000
6 % maturing 1 March 1996	4,000,000	4,000,000
6½% maturing 1 October 1996	6,100,000	6,100,000
5½% maturing 31 December 1999	8,210,000	8,210,000
	109,400,000	99,400,000
Less sinking fund assets held in trust by the Province of New Brunswick	10,102,436	7,894,391
	99,297,564	91,505,609
Principal and interest payable in United States funds—		
7¾% maturing 1 February 1974	5,000,000	5,000,000
5¼% maturing 2 January 1986	11,091,000	11,715,000
5¼% maturing 1 November 1986	4,763,000	5,004,000
5¼% maturing 1 September 1987	7,000,000	7,256,000
5 % maturing 15 April 1990	15,000,000	15,000,000
5½% maturing 1 May 1991	15,000,000	15,000,000
6 % maturing 15 November 1991	17,500,000	17,500,000
6½% maturing 15 October 1992	15,000,000	15,000,000
6¾% maturing 15 February 1993	15,000,000	15,000,000
7¾% maturing 1 February 1994	10,000,000	10,000,000
	115,354,000	116,475,000
	$ 214,651,564	$ 207,980,609

SCHEDULE 3—LOANS FROM THE PROVINCE OF NEW BRUNSWICK	1971	1970
For which debentures have been issued by the Province to provide funds for the Commission (payable in United States funds 1971—$13,982,000; 1970—$14,692,000)	$ 39,930,500	$ 48,316,500
Less sinking fund assets held by the Province relating to such debentures	11,523,810	$ 14,366,369
	$ 28,406,690	$ 33,950,131

SCHEDULE 4—LOANS FROM NORTHERN CANADA POWER COMMISSION FOR CAPITAL EXPENDITURES ON APPROVED PROJECTS AS PROVIDED UNDER THE ATLANTIC PROVINCES POWER DEVELOPMENT ACT		
Completed projects, less instalments paid—principal plus interest at rates ranging from 4½% to 8½% per annum payable in annual instalments to 2010	$ 61,709,140	$ 55,821,015
Completed projects—principal plus interest payable in forty annual instalments when the projects are formally accepted by Northern Canada Power Commission	—	1,596,499
Projects in progress	—	3,523,965
	$ 61,709,140	$ 60,941,479

SCHEDULE 5—RESERVES		
Insurance	$ 1,452,561	$ 1,296,978
Exchange on funded debt payable in United States dollars	8,141,236	8,209,181
Contingencies and rate stabilization	13,486,925	13,009,039
Water storage equalization	4,900,000	2,540,000
	$ 27,980,722	$ 25,055,198

COMPARATIVE STATEMENT OF OPERATING AND PHYSICAL STATISTICS

	31 March 1961	31 March 1964	31 March 1967	31 March 1970	31 March 1971
Plant Name Plate Capacity kw	265,025	406,636	530,961	1,032,286	1,032,286
Gross Generation—Purchases kwh	1,273,719,910	1,797,928,340	3,013,532,860	4,196,431,200	4,747,813,599
Total Energy Distributed	1,164,731,270	1,656,768,900	2,740,322,630	3,845,776,960	4,378,370,155
Total Revenue	$ 18,971,596	$ 24,650,853	$ 37,601,262	$ 48,036,037	$ 55,101,439
Total Expenditure	$ 18,678,045	$ 24,222,115	$ 36,768,208	$ 47,529,949	$ 54,545,893
Fixed Assets, including Work in Progress	$ 148,280,363	$ 184,956,439	$ 291,563,329	$ 389,457,753	$ 405,122,275
Current Assets	$ 8,405,451	$ 10,988,963	$ 22,568,177	$ 26,176,000	$ 25,486,195
Current Liabilities	$ 6,501,280	$ 6,336,013	$ 16,881,328	$ 19,933,910	$ 20,206,936
Inventories	$ 1,370,132	$ 1,505,507	$ 2,531,868	$ 3,005,720	$ 2,841,733
Long Term Debt—Net	$ 118,714,096	$ 147,622,243	$ 231,788,724	$ 302,872,219	$ 304,767,394
Sinking Fund Assets	$ 12,735,730	$ 15,220,609	$ 17,667,316	$ 22,260,760	$ 21,626,246
Accumulated Depreciation	$ 23,195,222	$ 34,267,534	$ 49,386,725	$ 69,224,260	$ 78,549,329
Other Reserves	$ 4,176,912	$ 10,282,300	$ 18,467,886	$ 25,055,198	$ 27,980,722
Reserves and Accumulated Depreciation	$ 27,372,134	$ 44,549,834	$ 67,854,611	$ 94,279,458	$ 106,530,051
Total Reserves—Percentage Fixed Assets	18.5	24.1	23.3	24.2	26.3
Circuit Miles Transmission Lines	1,585	1,947	2,315	2,549	2,601
Miles Distribution Circuits	7,905	8,447	8,664	8,810	8,872
Number Retail Customers	101,049	107,948	112,097	131,471	138,213
Number Industrial Customers	1,980	2,552	2,651	751	786
Number Commercial Customers		7,943	10,005	11,072	11,495
Number Street Light Customers				1,408	1,495

In 1964 a Commercial Rate was established and transfers to and from the other classifications have since been made following an analysis of each service. Manufacturing and processing industries are now included as Industrial Customers.

50TH ANNIVERSARY

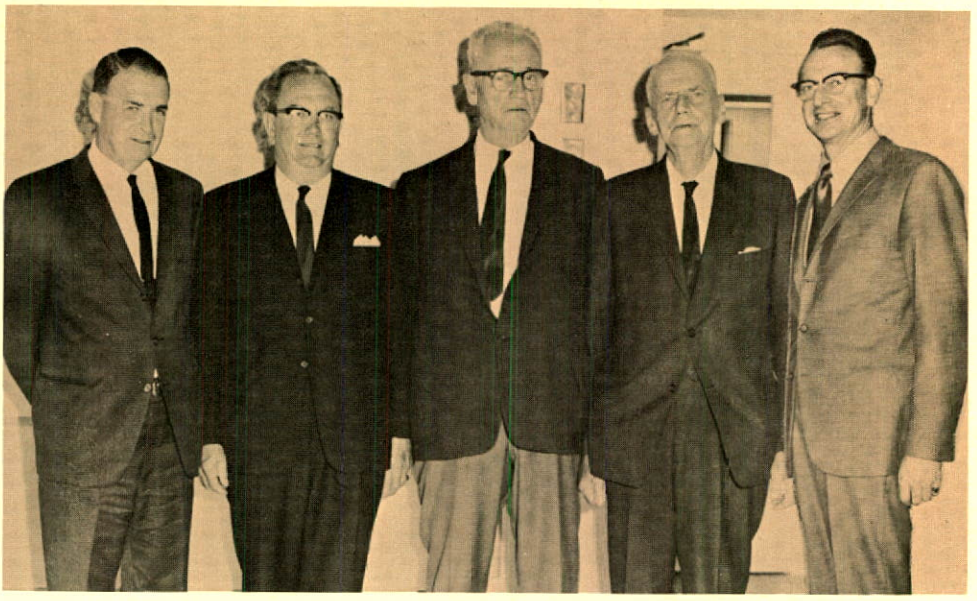
The New Brunswick Electric Power Commission marked its fiftieth anniversary of operation during the year. This historical milestone was given prominence by a multitude of events stressing employee participation. The theme was also carried on in all sales and marketing programs.

A 50th Anniversary logo was designed for use and was prominently featured on all the Commission's exhibits, displays, and printed material.

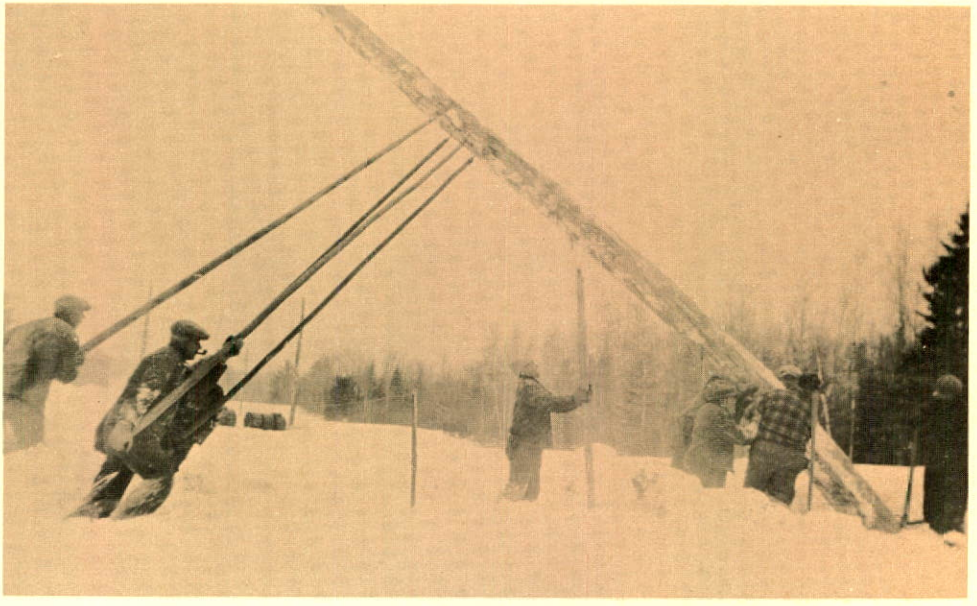
Incidents that took place in the early days of the Commission were recalled in Provincial newspapers and our employee publication "Current Events". These incidents, including some nostalgic photographs, are still fresh in the minds of many employees and people of the Province, reminding them of the coming of electricity, particularly to the rural areas in the early days of the Commission.

Besides the many programs featuring employee participation, two special efforts stood out in the 50th Anniversary activities. One was the Mactaquac Art and Handicraft Exhibit, held in the generator hall of the Mactaquac Generating Station. Thousands of people visited the exhibit during the four-day showing. The other program was a Christmas-theme Art Contest for employees' children between six and fourteen years of age. The contest was judged a resounding success by all participants and the general public.

It is hoped that the Commission spirit produced by these activities will continue in the future at such a high level, and that many of the programs can be renewed each year to maintain this spirit.



A recent photo of Chief Engineers of the Commission. *From left*, the present incumbent L. J. Whalen, R. E. Tweeddale, J. L. Feeney, S. R. Weston and A. J. O'Connor.



These pictures recall construction and transportation methods in the early days of the Commission.

New Brunswick has a legacy of nature in the tremendous water depths in the Bay of Fundy. A view of the Canaport deepwater terminal with a supertanker at the offshore mooring terminal.

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